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# VALIDATION OF A MEDLINE SEARCH INSTRUMENT: ASSESSING PRACTICE BASED LEARNING IMPROVEMENT IN RESIDENCY PROGRAMS


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## WHY ASSESS SEARCHING SKILLS?

**THE COMPETENT PHYSICIAN**

- Effective searching makes for better patient care

**ACGME COMPETENCIES**

- **Focus on Problem-based Learning & Improvement**

**LIFELONG LEARNING**

## OBJECTIVES

The Accreditation Council for Graduate Medical Education (ACGME) mandates outcome assessment of Practice-based Learning and Improvement , a key component of which is assessment of the EBM process to acquire evidence efficiently. However, there are currently no validated instruments that measure residents' MEDLINE searching performance. **Our goal was to validate a MEDLINE search instrument used by librarians at a large academic center.**

## METHODOLOGY

In 2001, 20 Pediatric & Medicine-Pediatrics interns received an instruction session by a librarian on effective MEDLINE searching (Ovid)

- Residents' pre- and post-training search strategies were assessed by two librarians for a specific clinical case using an instrument we designed to evaluate MEDLINE searching (modified from the University of Rochester instrument).
- Searchers were required to identify the searchable clinical question and conduct a search. The search strategies were evaluated based upon a gold standard search.
- For comparison, a second cohort of graduating residents searches were evaluated in 2002
- In 2004, 15 of the same residents were assessed on the same case, and scored by the same librarians using the Michigan instrument
- In 2008, 9 faculty with EBM expertise conducted the same search, again scored by the same librarians and evaluated using the Michigan instrument

**The Clinical Question: Are bronchodilators effective in treating bronchiolitis in infants?**

**Example Search and Evaluation:**

**1 exp Bronchiolitis Obliterans/ or exp Bronchiolitis/ or exp Bronchiolitis, Viral**
**2 exp Bronchodilator Agents/**
**3 exp Pediatrics/**
**4 1 and 3 and 2**
**5 exp Therapeutics/**
**6 1 and 3 and 5**
**7 6 and 2**

Question: Are bronchodilator agents effective in treating bronchiolitis in infants?

| Search Tactic | 15 pts | 10 pts | 5 pts | No pts |
|---|---|---|---|---|
| 1. Included all search concepts (+5/concept) bronchiolitis, bronchodilator agents, infant | | X | | |
| 2. Use of MeSH (+5/concept) bronchiolitis, bronchodilator agents | | X | | |
| 3. Exploded MeSH concepts (+5/concept) | | X | | |
| 4. Used of proper subheading i.e. tu or dt (+5) | | | | X |
| 5. Use of all age limits i.e. infant & newborn (+5/concept) | | | | X |
| 6. Limit – human & English (+5/concept) | | | | X |
| 7. Focused – one or more concept (+5) | | | | X |
| 8. Used appropriate Boolean (+5) | | | X | |
| 9. Combined all concepts (+10) | | X | | |
| 10. Looked for evidence (+10) a) Limit by publication type (clinical trial, meta-analysis, practice guidelines, RCT, multicenter study,) b) Limit to EBM reviews c) Used MEDLINE EBM filter | | | | X |
| 11. Search efficiency i.e. did not limit every search statement, did not combine too many sets – minimum steps necessary (+10 pts) | | | X | |
| Subtotal (Positive Score 100 points possible) | | | | |

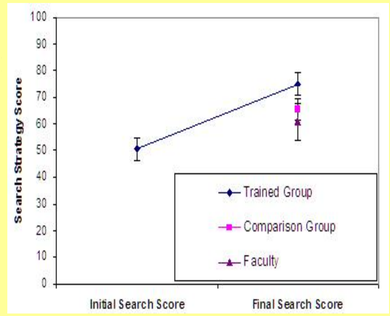
| Search tactic | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1. Inappropriate limits i.e. year (-5/limit) | 5 | 5 | 5 | 5 | 5 | 5 | 5 |
| 1. Incorrect term including subheading (-10/incorrect term or subheading) Pediatrics, Therapeutics | 10 X | 10 X | 10 | 10 | 10 | 10 | 10 |
| Subtotal (Negative Score) | | | | | | | |

**ELEMENTS MEASURED BY THE INSTRUMENT**

1. **Included all search concepts**
2. **Use of MeSH**
3. Exploded MeSH
4. Use of proper
5. subheadings
5. **Limit – Human & English**
6. Focused one or more concept
7. Use of appropriate Boolean
8. **Combined all concepts**
9. Looked for evidence e.g. RCT
10. **Search efficiency**
11. Inappropriate Limits (negative)
12. Incorrect term in Subheading

## SUMMARY OF RESULTS

- Pre-Post Improvement for Intervention Cohort
- Post intervention better than Comparison Cohort 2
- Post –intervention no different from Faculty experts




## CONCLUSIONS

We were able to validate the MEDLINE search instrument as an effective way to measure MEDLINE search skills

## NEXT STEPS

- Revise the search instrument to focus on identified critical search elements
- Creation and validation of a PubMed search assessment instrument